

IPANEMIDAE, NEW FAMILY, *IPANEMA TALPA*,
NEW GENUS AND SPECIES, FROM THE
SURF ZONE OF BRAZIL
(CRUSTACEA: AMPHIPODA: HAUSTORIOIDEA)

J. L. Barnard and James Darwin Thomas

Abstract.—A new family of haustorioid Amphipoda resembling the Phoxocephalopsidae and Urothoidae has been discovered in sands of the surf zone off Rio de Janeiro, Brazil. Like the recently described Cheidae, the new species-genus-family combines various characters of haustorioids in a unique manner and bears one unprecedented apomorphic character: an alate, uncleft telson.

The new taxon has the following characters of Urothoidae: antenna 2, head, and distal parts of pereopods but has a distinctive antenna 1, coxae 1-2, mandibular palp, telson and epimera 1-2. *Ipanema* has the following characters of Phoxocephalopsidae: coxae, mandibles, and uropod 1 but has distinctive antennae 1-2, epimera 2-3, pereopods 5-7 and telson. The taxon has some characters found mostly or only in Urohaustoriidae, such as epimera 2-3, but differs in many ways from that family, such as: head, antennae 1-2, parts of mandibles and maxillipeds, maxilla 1, parts of pereopods 3-7, epimeron 1, and especially uropods 1-2.

The Ipanemidae are created for *Ipanema talpa*. The unusual combination of antennae 1-2 with mouthparts, uropods 1-2, head shape and pereopods precludes its assignment to any existing family group. It bears an apomorphic telson not heretofore described from the superfamily Haustorioidea except in the otherwise remote Urohaustoriidae. *Ipanema* combines characters of Phoxocephalopsidae, Urothoidae and Urohaustoriidae. For example, antenna 2 and to a certain extent antenna 1 have characters of Urothoidae, whereas coxae 1-4 and uropod 1 are like Phoxocephalopsidae while the epimera have some characters of Urohaustoriidae.

Corrections to literature.—We have re-evaluated the cephalic cheek of Phoxocephalopsidae to be well developed in contrast to the opinion of Barnard & Drummond (1982).

Ipanemidae, new family

Type genus.—*Ipanema*, new genus. Gender feminine.

Etymology.—A beach of Rio de Janeiro, Praia de Ipanema.

Diagnosis.—Rostrum weak, broad; cheek strong. Antenna 1 of neither haustoriid nor urothoid form, peduncle short, no articles elongate, each thick, article 1 with weak setation, article 2 furnished with dense row of spines, article 3 about 0.67 as long as article 1, poorly armed; no geniculations present; flagellum longer than peduncle and heavily armed with aesthetascs; accessory flagellum 2-articulate. Antenna 2 of urothoid form, articles 4 and 5 slender, with long lines of spines not organized into ranks, posterior margins lacking glass-spines (typical of Urohaustoriidae), ordinary setae and bulbar setae extremely sparse, flagellum very short, 3-articulate. Epistome and upper lip fused

together, lower margin rounded. Right and left mandibles alike, with narrow but stubby and simple incisors lacking teeth laciniae mobiles alike, rakers absent, molar of medium size (compared to Urothoidae), weakly triturative, choppers weak to absent; palp 3-articulate, article 3 with urohaustoriid setal-spine distribution (versus urothoid setal distribution), spines hooked but unawned. Lower lip with mandibular lobes well developed. Maxilla 1 with biarticulate palp, inner plate small and spout-like, with 1 large seta. Inner plate of maxilla 2 without oblique facial seta row, with one medial seta. Maxillipeds with unexpanded bases and no baler lobes, with rather small inner plate but normally enlarged and spinose outer plate; palp 4-articulate, article 2 expanded, article 4 rectangular, with 2 thin nail-setae.

Coxae 1–2 minute and hidden by coxa 3, coxa 4 dominant, weakly excavate behind, coxa 3 adz-shaped; coxae 5–6 with comma-shaped posterior lobe. Gnathopods feeble, subsimilar, simple (gnathopod 2 with minute palm), article 3 short. Article 5 of pereopods 3–4 slender, not lobate; dactyls of pereopods 3–7 well developed; pereopod 5 of weakly haustorious form, article 2 expanded, articles 4–5 weakly expanded and with few facial spines; article 2 of pereopods 5 and 7 diverse, with that of pereopod 6 intermediate in form; no pereopod with underslung articulation. Gills on coxae 2–5 only, 6–7 apparently without gills because of long forward reach of beating pleopods, gill 2 (on coxa 2) spear-shaped, others decreasing in size, subrectangular sacs.

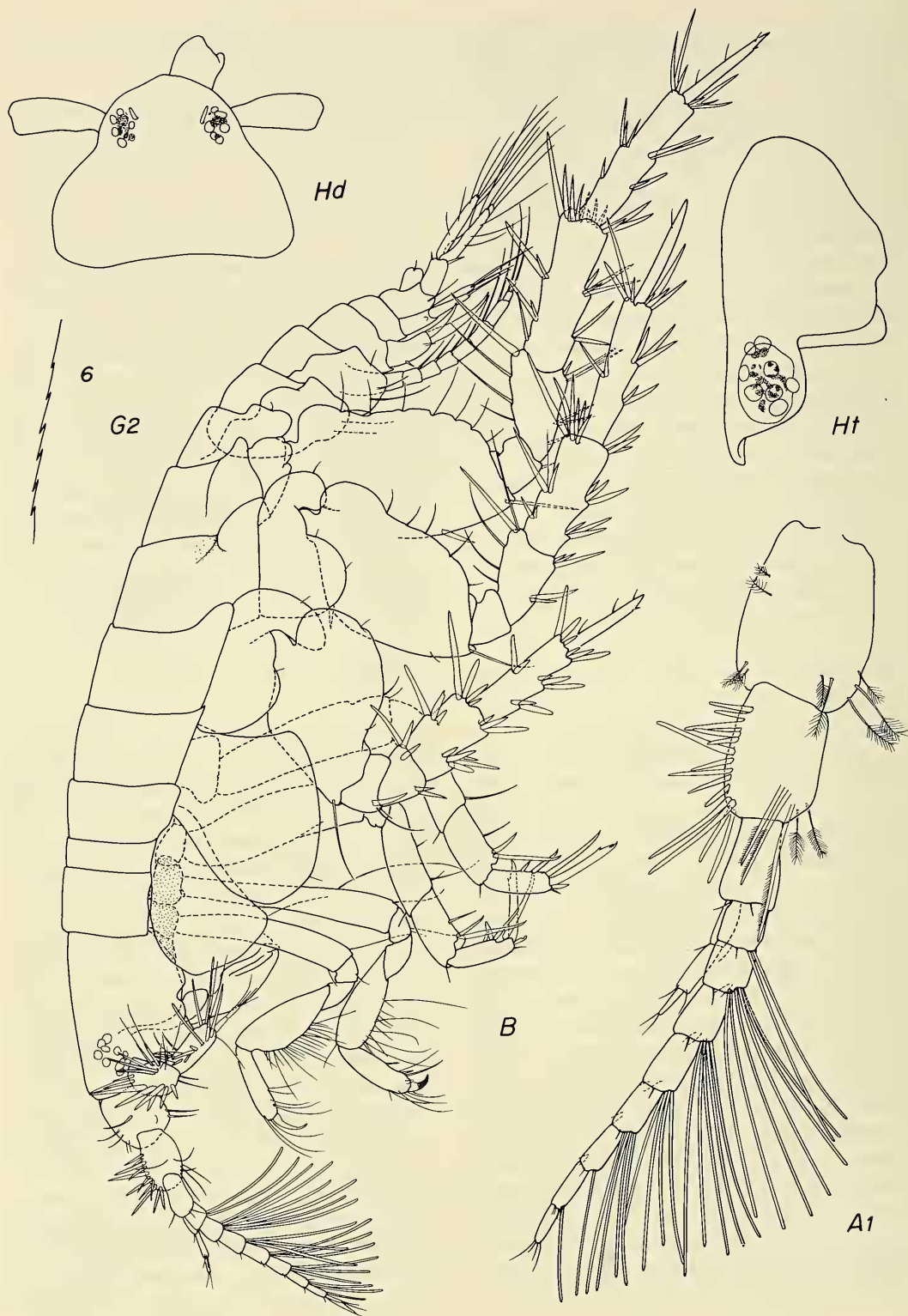
Pleopods like urohaustoriids, thus peduncles wider than long, pleopod 3 inferior; peduncles as long as wide. Epimeron 1 fully developed, small, with 1 seta, epimera 2–3 equally dominant, all epimera with posterodorsal “hip.” Urosomites ordinary. Rami of uropod 1 styliform, naked; of uropod 2 rod-like and spinose; uropod 3 of ordinary haustorioid-phoxocephalid kind, neither ramus dominant, article 2 on outer ramus small and poorly setose.

Telson very short, much wider than long, essentially entire, each side with alate lobe projecting upward.

Relationship.—Differing from the Phoxocephalopsidae in the completely distinctive antennae 1–2, of which antenna 1 has a heavily spinose (versus setose) article 2 and the accessory flagellum is poorly developed; of which antenna 2 has slender articles 4–5 bearing large facial spines in lines rather than small spines in ranks and on which the posterior margins have almost no long setae, almost no bulbar setae and no glass spines. Also differing from Phoxocephalopsidae in the thin article 5 of pereopods 3–4; the diversity of article 2 on pereopods 5–7, with article 2 on pereopod 5 constricted apically; thin apical articles of pereopods 5–7; the presence of a long comma-shaped posterior lobe on coxae 5–6; the equal size of epimera 2–3 and the hips on epimera 1–3; the strange telson (versus ordinary and cleft); and the reduced inner plate of maxilla 1 bearing a single seta.

Differing from Urothoidae in the short articles of the peduncle on antenna 1, with article 2 heavily spinose, the long primary flagellum of antenna 1; the kind and distribution of setal-spines on article 3 of the mandibular palp (versus regular setae and presence of an A-seta in Urothoidae); the tiny coxae 1–2; the hipped shapes of epimera 1–3; and the more delicate mandible.

Phoxocephalopsidae and Urothoidae appear to be more closely related than previously perceived: both have a well developed lateral cephalic cheek, styliform rami on uropods 1–2 and many similarities in mandibles, maxillae, and maxillipeds. Phoxocephalopsids differ from urothoids principally in the antennae, in which articles 1–3 of antenna 1 are short, not geniculate, with huge setal patch on article 2; article 4 of antenna 2 is widely expanded and bears 3 kinds of posterior armaments, including glass spines; article 5 also is expanded and bears 2 kinds of armaments posteriorly; the mandibular palp bears hooked setal-spines



and the dactyl of the maxilliped is less elongate and less unguiform.

Differing from the Cheidae in the large molar and lack of significant rostrum, normal uropod 2, untoothed incisors and simple gnathopods.

Differing from the complex Pontoporeiidae in the shortened peduncles of the pleopods, the short article 1 of antenna 1 and the lack of long setae (distinct from spines) on pereopods 5–7; also differing from all pontoporeiids except *Priscillina* in the spinose antenna 2.

Differing from the Haustoriidae in the 4-articulate (versus 3-) palp of the maxilliped, the presence of only spines (no flexible setae) on pereopods 5–7, the hidden coxae 1–2, large mandibular lobes of the lower lip, the presence of only a few stiff spines (no long flexible setae) on mandibular palp article 3, the unexpanded article 4 of antenna 2, the poor setation on the inner plates of maxillae 1–2 and the ordinary, non-enlarged outer plate of maxilla 2.

Ipanema, new genus

Type species.—*Ipanema talpa*, n. sp.

Diagnosis.—With the characters of the family.

Ipanema talpa, new species

Figs. 1–4

Etymology.—L., talpa, mole.

Description (of holotype male “s” 2.57 mm).—Rostrum obsolescent; eyes medium, ommatidia few, interspersed in alcohol with faint purplish pigment, each with anteromedial ovate ganglion. Antenna 1 article 1 with sparse penicillate setules, article 3 almost naked, accessory flagellum 3-ar-

ticulate, primary flagellum long, with 8 articles, formula of aesthetascs on articles 1–8 = 2-6-5-4-4-1-1-x (vestigial). Article 4 of antenna 2 with anterolateral line of 14 spines mostly alternating long and short spines pointing in alternate directions, with 3 anterodistal spines; posterior margin and face with 3–4 bulbar setules, posterodistal corner with line of 4 spines and seta and 2 marginal setae; article 5 with anterolateral line of 8 spines mixed long and short, posterior margin mostly naked, posterodistal corner and apex with 5 long setae, 2 bulbar setae; flagellum with 2 articles.

Upper lip and epistome forming large subcircle from anterior view. Right and left mandibles identical, incisor extended, moderately narrow, simple; lacinia mobilis linguiform; rakers absent; molar large, weakly tritulative, with weak chopper region, no seta; mandible organized so that when pressed into flat plane palp extending in odd direction (see illustration of labral-mandibular complex), article 1 short, article 2 with 1–2 small midlateral setae, article 3 with 5 mixed-size apical spines in haustoriid formula of 2-2-1. Lower lip without cones. Maxilla 1 with small spout-like inner plate bearing one long seta, outer plate with 9 simple spines, palp feeble, 2-articulate, slender, reaching less than two-third along outer plate, with 2 huge apical setae. Inner plate of maxilla 2 narrower and shorter than outer plate, without oblique facial seta row, with one medial seta, outer plate with 2 apicolateral setae. Inner plate of maxilliped rather small and very broad (relative to other haustorioids), with one medial seta, one apical seta and 2 penicillate spines; outer plate spinose medially, naked apically; palp huge, article 2 expanded and medially setose, ar-

Fig. 1. *Ipanema talpa*, holotype male “s” 2.57 mm. Capital letters in figures refer to parts; lower case letters to left of capital letters refer to specimens and to the right refer to adjectives as described below: A, antenna; B, body; C, coxa; E, epimeron; G, gnathopod; H, head; J, prebuccal; L, labium; M, mandible; P, pereopod; Q, spine; R, uropod; S, maxilliped; T, telson; U, upper lip; V, palp; W, pleon; a, anterior; d, dorsal, t, left.

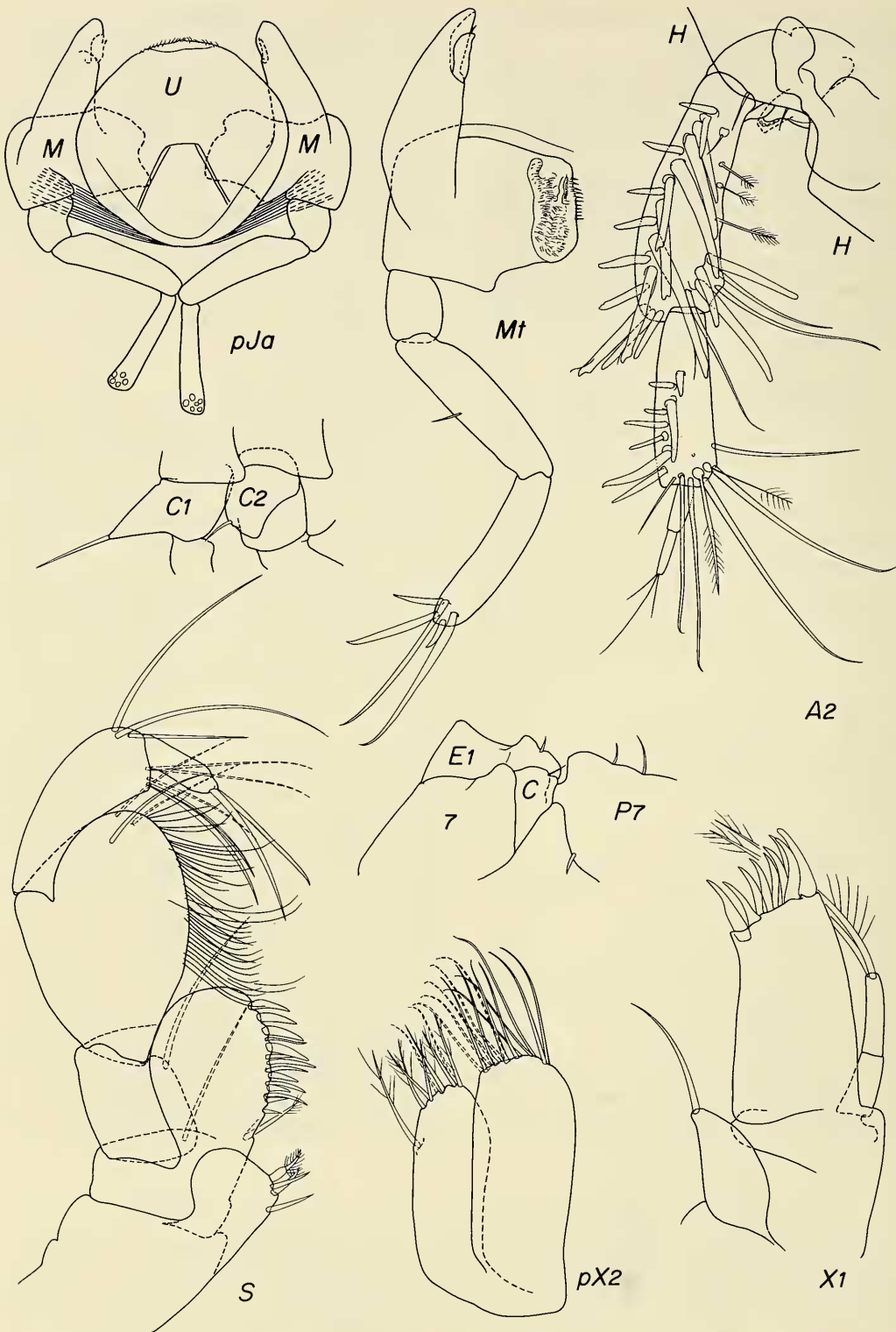


Fig. 2. *Ipanema talpa*, unattributed figures = holotype male "s" 2.57 mm; p = male "p" 2.98 mm. Letter codes, see Fig. 1.



Fig. 3. *Ipanema talpa*, unattributed figures = holotype male "s" 2.57 mm; p = male "p" 2.98 mm. Letter codes, see Fig. 1.

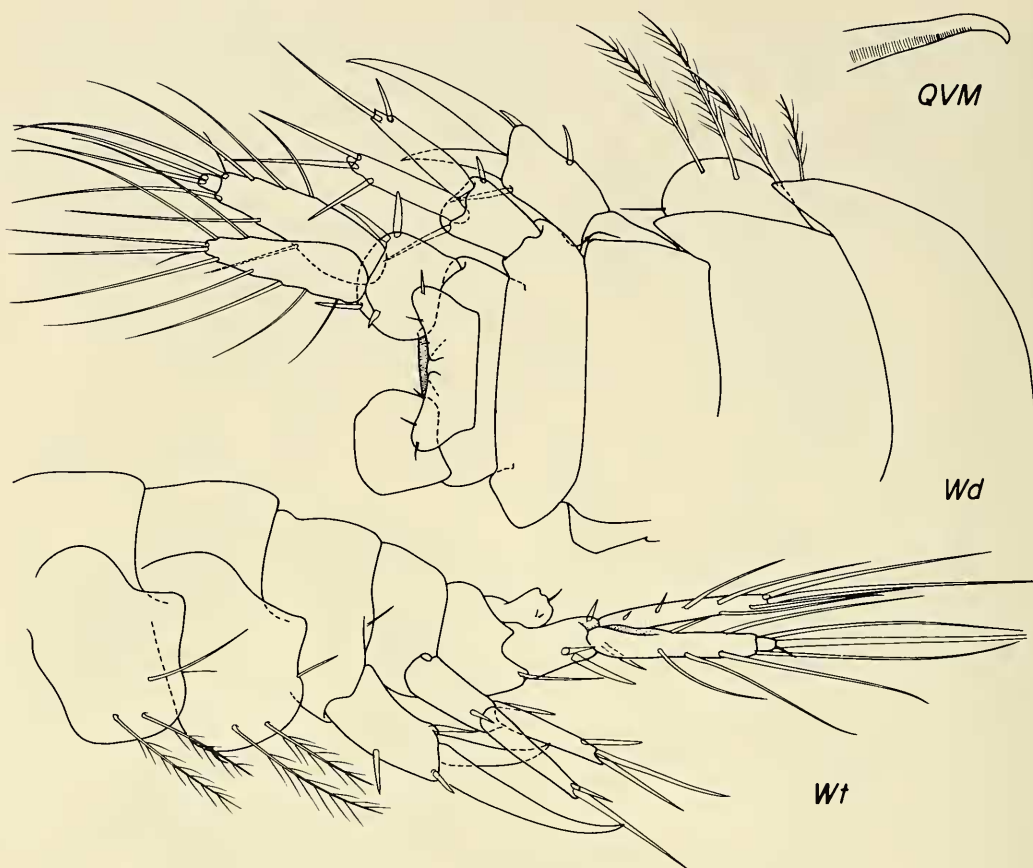


Fig. 4. *Ipanema talpa*, holotype male "s" 2.57 mm. Letter codes, see Fig. 1.

ticle 3 curved and fitting hump of article 2, dactyl not unguiform but not stubby, rectangular, armed with 2 huge apical setal-spines.

Coxae 1–2 very small, hidden by coxa 3, coxa 1 extended forward into point armed with stiff setal-spine. Article 2 of gnathopods 1–2 and pereopods 3–4 poorly setose; article 5 of gnathopod 1 broader and more strongly setose than on gnathopod 2, gnathopod 1 simple, gnathopod 2 scarcely subchelate, with shorter dactyl than gnathopod 1, with minute non-skid scales on propodus (see enlarged illustration, Fig. 1).

Pereopods 3–4 alike, article 4 with naked margins, one long seta at each apex, article 5 narrow but with weak posterodistal lobe

armed with 3 spines; many spines of all pereopods with lines of bosses and apical bifidation formed by enlarged boss, some multibossed at apex; article 6 slender, spine formula = 3-3-1; dactyl long and straight, with inner boss near apex. Article 2 of pereopod 5 grotesque, expanded and lobate proximally, tapering sharply at apex, of pereopod 7 almost evenly ovato-rectangular and bearing about 7 long posterior setae, of pereopod 6 intermediate between 5 and 7; dactyls elongate, like those of pereopods 3–4. Pereonites 6–7 and pleonites 1–3 with lateral ridge. Epimera 1–3 similar, with hipped posterodistal corner, weakly excavate posterior margin bearing setule, rounded ventral margin with 2 long facial setae

on epimera 2–3, epimeron 2 also with mid-posterior facial seta. Pleopods with 2 coupling hooks, outer rami about 1.5 times as long as inner, articles on outer rami = 9–8–7, on inner rami = 6–6–5.

Urosome ordinary. Uropod 1 with short peduncle bearing ventrolateral spine, ventrodistal spine, distomedial spine, rami styliform and naked, outer very long and exceeding apex of uropod 2, inner much shortened. Uropod 2 with short peduncle and apical spine on each side; rami rod-like, outer with one apical and one apicolateral spine, inner with 2 apical and one apico-medial spine. Uropod 3 with short peduncle bearing 2 apical spines on each side, rami elongate, inner almost as long as outer, well setose, outer with small second article bearing 2 long setae. Telson 2.4 times as wide as long, with lateral wings bearing 3 setules each.

Female.—None. All specimens are males, with large penial processes.

Illustrations.—Mandible and maxilla 1 enlarged equally.

Holotype.—USNM 195181, male “s” 2.57 mm.

Type locality.—Brazil, Rio de Janeiro, Praia Vermelha, Rio Orca Beach, 7 May 1985, coarse sand, 4 m, with numerous small echinoids and platyischnopid amphipods, coll. J. D. Thomas.

Material.—From type locality, USNM 196184, male “p” 2.98 mm, male “q” 2.95 mm, male “r” 2.10 mm and 4 other males.

Distribution.—Brazil, Rio de Janeiro, outer surf zone, 4 m.

Acknowledgments

We thank Dr. David Challinor, Assistant Secretary for Science of the Smithsonian Institution, for providing funds to travel to Brazil. The second author also was supported by NSF Grant BSR-8515168. We thank Linda B. Lutz of Vicksburg, Mississippi for inking our illustrations. Janice Clark assisted us in the laboratory. Dr. Gloria Alonso kindly offered us valuable suggestions for improvements.

Literature Cited

Barnard, J. L., & M. M. Drummond. 1982. Gammaridean Amphipoda of Australia, Part V: Superfamily Haustorioidea.—Smithsonian Contributions to Zoology 360:1–148.

(JLB) Department of Invertebrate Zoology, NHB-163, Smithsonian Institution, Washington, D.C. 20560; (JDT) Reef Foundation, P.O. Box 569, Big Pine Key, Florida 33043.